Claims

1. A substantially planar transformer comprising a plurality of windings and having an intermingled portion in which at least a portion of a first winding is intermingled with at least a portion of at least a second winding, wherein each full turn of each winding in said intermingled portion is effected by one self-crossing and two crossings of each other winding having turns in said intermingled portion.

2. A transformer according to claim 1, having a first winding and a second winding, both windings having the same number of turns, wherein the intermingled region comprises substantially the whole of both windings.

3. A transformer according claim 1, having a first winding and a second winding, the first winding having a greater number of turns than the second winding, wherein at least one of the excess turns of the first winding encompasses the intermingled region.

4. A transformer according claim 1, having a first winding and a second winding, the first winding having a greater number of turns than the second winding, wherein at least one of the excess turns of the first winding is encompassed by the intermingled region.

5. A transformer according to claim 1, having first, second and third windings.

6. A transformer according to claim 5, having an intermingled region including turns of said first, second and third windings.

7. An integrated circuit including a substantially planar transformer, the transformer comprising a plurality of windings and having an intermingled portion in which at least a portion of a first winding is intermingled with at least a portion of at least a second winding, wherein each full turn of each winding in said intermingled portion is effected by one self-crossing and two crossings of each other winding having turns in said intermingled portion.

8. An integrated circuit according to claim 7, wherein the transformer has a first winding and a second winding, both windings having the same number of turns, and the intermingled region comprises substantially the whole of both windings.

9. An integrated circuit according claim 7, wherein the transformer has a first winding and a second winding, the first winding having a greater number of turns than the second winding, and at least one of the excess turns of the first winding encompasses the intermingled region.

10. An integrated circuit according claim 7, wherein the transformer has a first winding and a second winding, the first winding having a greater number of turns than the second winding, and at least one of the excess turns of the first winding is encompassed by the intermingled region.

11. An integrated circuit according to claim 7, wherein the transformer has first, second and third windings.

12. An integrated circuit according to claim 11, wherein the transformer has an intermingled region including turns of said first, second and third windings.

13. An integrated circuit according to claim 7, wherein the turns of said transformer a formed from a plurality of stacked conductive paths, the paths forming each winding being united by vias.

14. An integrated circuit according to claim 13, wherein at least one of said crossings comprises first and second bridges between radially separated conductors, the bridges being between conductive paths in respective layers and crossing each other.

15. An integrated circuit according to claim 14, wherein the first bridge is narrower than the second bridge and the first bridge and the second bridge have substantially the same resistance.

16. An integrated circuit according to claim 14, wherein, at said at least one of said crossings, the conductors in a layer which are not connected to a bridge also in that layer are chamfered to provide a terminal edge lying parallel to a side edge of the bridge in the same layer.

17. An integrated circuit according to claim 13, wherein uniting vias are located adjacent to said crossings.

18. An integrated circuit according to claim 14, including a lower conductor layer forming a capacitive shield at said crossings.

19. An integrated circuit according to claim 18, wherein said lower conductor layer does not contain any bridges and comprises two opposed pairs of parallel fingers terminating close together under each crossing.

20. An integrated circuit according to claim 7, including a ground shield underlying the transformer.

21. An integrated circuit according to claim 20, wherein the ground shield comprises a plurality of substantially radially extending fingers, the fingers being connected by a broken ring.

22. An integrated circuit according to claim 21, wherein the ring is located inwards from the outer periphery of the ground shield such that the transformer's magnetic field is substantially parallel to the integrated circuit's surface at the broken ring.